

EXHIBIT D

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

GOOGLE LLC,

Plaintiff

v.

SONOS, INC.,

Defendant.

CASE NO. 3:20-cv-06754-WHA
Related to CASE NO. 3:21-cv-07559-WHA

**OPENING EXPERT REPORT OF DR. DAN SCHONFELD REGARDING U.S. PATENT
NO. 10,848,885 AND U.S. PATENT NO. 10,469,966**

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substantially the same during each of those time frames, as discussed below. *See also*, BOSE_SUB-0000602; BOSE_SUB-0000658; BOSE_SUB-0002259

856. The capabilities and features of the Bose Lifestyle are apparent from documents that Bose has made available to the public and produced in this case, the products themselves, technical documentation, public documentation regarding that system, professional and customer reviews, and other sources discussed below. BOSE_SUB-00000001-2610.

857. I understand that Dr. Almeroth asserts that I rely “on disclosures in various materials related to other Bose products, namely, Bose Lifestyle SA-2 and SA-3 Amplifiers and their ability to be added to a Bose link media center of a Bose Lifestyle® 18 series II, 28 series II, 38 or 48 home entertainment system; Bose link communication protocol; and Bose FreeSpace EF Series II Business Music System. Dr. Schonfeld has not explained how such disclosure is relevant to the operation of the actual Bose Lifestyle 50 System upon which he claims to rely for invalidity.” These products, however, are all Bose products relating playing audio on speakers and thus are all part of the same endeavor. For example, SA-2 and SA-3 Amplifiers are both part of the “Lifestyle” family to which the Bose systems belongs. *See e.g.*, BOSE_SUB-0000274; BOSE_SUB-0000361. I also note, that other than his conclusory opinion, Dr. Almeroth does not provide any evidence that the above-mentioned products are incompatible.

858. In my opinion, Claim 1 is rendered obvious based on the Bose Lifestyle in view of the general knowledge of a POSITA, the Sonos Forums, Nourse, Millington, and Rajapakse, as described below. Below, I analyze each element of Claim 1 and demonstrate why that claim is invalid.

35. Limitation 1 (preamble): “A first zone player comprising:”

859. To the extent the preamble is limiting, Bose Lifestyle discloses the preamble in my opinion. For example, the Bose Lifestyle was publicly available no later than October 17, 2001.

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BOSE_SUB-0000122. *See also*, BOSE_SUB-0000361-448. As another example, as described below, Bose also allows for music playback at the dining room, bar, patio, and restrooms at a restaurant. As stated, each can be considered its own “zone.”

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Connecting additional rooms

Follow the placement guidelines for the Bose® powered speakers that you plan to connect. Then review your plan for how to connect these speakers to the multi-room interface in your primary room. If you have questions or need extension cables to complete the connections, call Bose Customer Service at the numbers listed on the back inside cover of this owner's guide.

CAUTION: Make sure all components are unplugged from the power outlet before you begin hooking up additional speakers.

Connect the audio input cable from your additional powered speakers to the selected ROOM jack on the back of the multi-room interface.

1. Plug the small black multi-pin connector (flat side facing up) into the jack marked ROOM B, C, or D on the back of the interface.
2. Follow the instructions that came with your speakers for connecting the cable to the speakers.

Note: Be sure that each connector is inserted completely into each jack.

Figure 47

ROOM jacks on the multi-room interface



Room A, B, C, and D jacks

Id. at 40. See also, BOSE_SUB-0000361-448.

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Setting Up Your Lifestyle® Stereo Amplifier

Multi-room interface setup

English

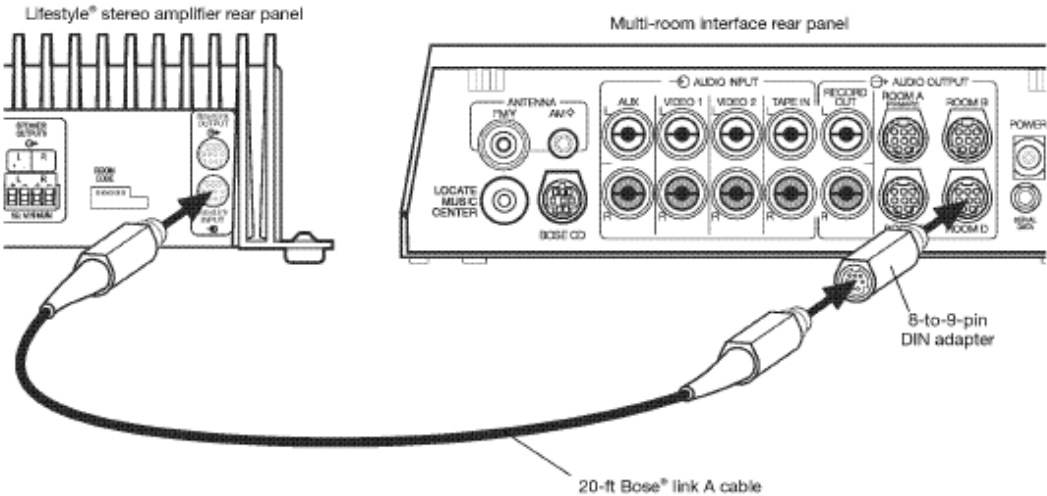
CAUTION: Before making any connections, turn the Lifestyle® system off and disconnect the music center from the AC (mains) power outlet. DO NOT plug the amplifier into an outlet until you have completed all other connections.



1. Insert the 8-to-9-pin adapter into one of the unused ROOM output connectors (B, C, or D) on the rear of the multi-room interface (Figure 10).
2. Insert one end of the Bose® link A cable into the 8-to-9-pin adapter.
3. Insert the other end of the Bose® link A cable, into the Bose® link input connector on the rear panel of the Lifestyle® stereo amplifier.

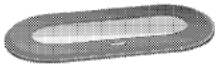
Figure 10

Lifestyle® stereo amplifier
to multi-room interface
connections



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Setting Up Your Lifestyle® Stereo Amplifier



Setting up the Personal® music center

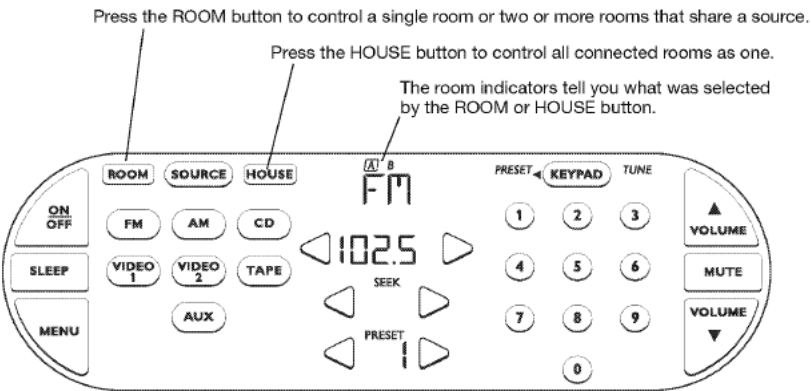
Systems that have a multi-room interface are controlled by the Personal® music center which requires no internal switch settings before it allows you to control more than one room of speakers. However, if you purchase a second Personal® music center, you must follow the procedure for setting up the Personal® music center for the first time.

Note: Refer to your Lifestyle® system owner's guide for more information on operating your system in more than one room.

Selecting other rooms with the Personal® music center

The Personal® music center allows you to control up to four sets of Bose® powered speakers placed in individual rooms. These rooms are referred to as room A, B, C, and D, with room A being the primary room (the one used for a one-room system). If two or more rooms are connected to your system, the Personal® music center displays ROOM and HOUSE buttons, and room indicators (A, B, C, and/or D). Figure 11 shows a sample display for a two-room system.

Figure 11
Sample display for a two-room system



BOSE_SUB-0000290.

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Setting Up Your Lifestyle® Stereo Amplifier

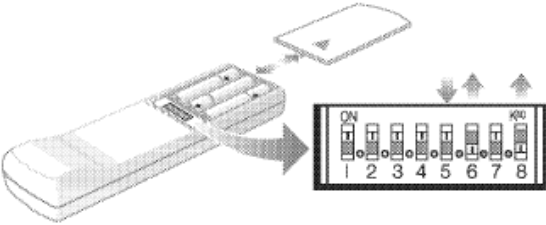
Setting up the RC-20 remote for Zone 2

If your system uses a Model 20 music center, you need to set up a second RC-20 remote control to operate the ZONE 2 outputs.

- 1. Remove the remote control battery cover and locate the miniature switches (Figure 13).
- 2. Make sure that the house code settings (switches 1, 2, 3, and 4) match those in your first remote.
- 3. Slide switch 5 down (off), and switches 6 and 8 up (on).

Note: Refer to your Lifestyle® system owner's guide for more information on operating your system in more than one room.

Figure 13
RC-20 remote Zone 2
switch settings



English

BOSE_SUB-0000292.

873. Bose Lifestyle provide instructions for setting up additional rooms.

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Setting Up Additional Rooms For Sound

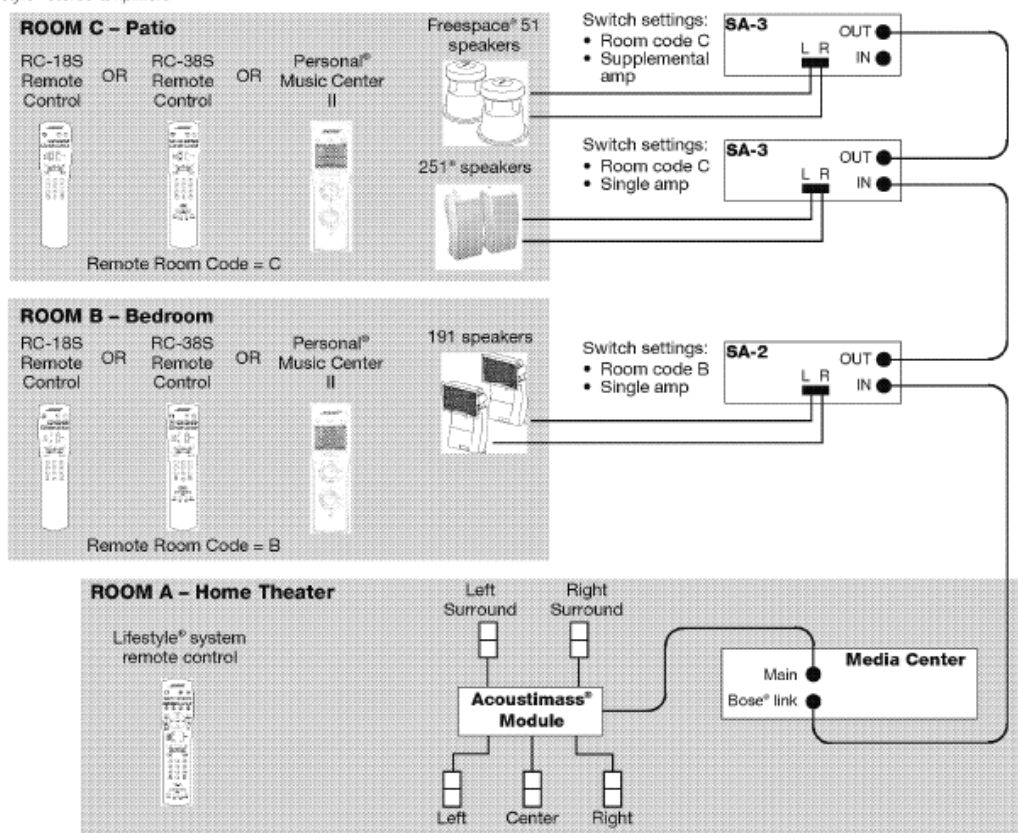
Setup guidelines for additional rooms

If you have a Lifestyle® 18 series II, 28 series II, 38 or 48 home entertainment system, you can experience stereo sound in up to 14 other rooms using Lifestyle® stereo amplifiers, compatible speaker systems and remote controls for the other rooms.

- Remote controls for other rooms must be set to the same house code as the main room remote, but each remote must be set to a different room code. See "Setting up remote controls for other rooms" on page 23.
- The Lifestyle® amplifier and its remote control must be set to the same room code. See "Setting up the amplifier room code" on page 24.
- When using more than one amplifier to power more than two speakers in a room (Figure 18, room C), all amplifiers must be set to the same room code. Also, one amplifier must be set to the single amp mode and all others must be set to the supplemental amp mode. See "Single and supplemental amplifiers" on page 25.

Figure 18

Sample installation of Lifestyle® stereo amplifiers



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Setting Up Additional Rooms For Sound

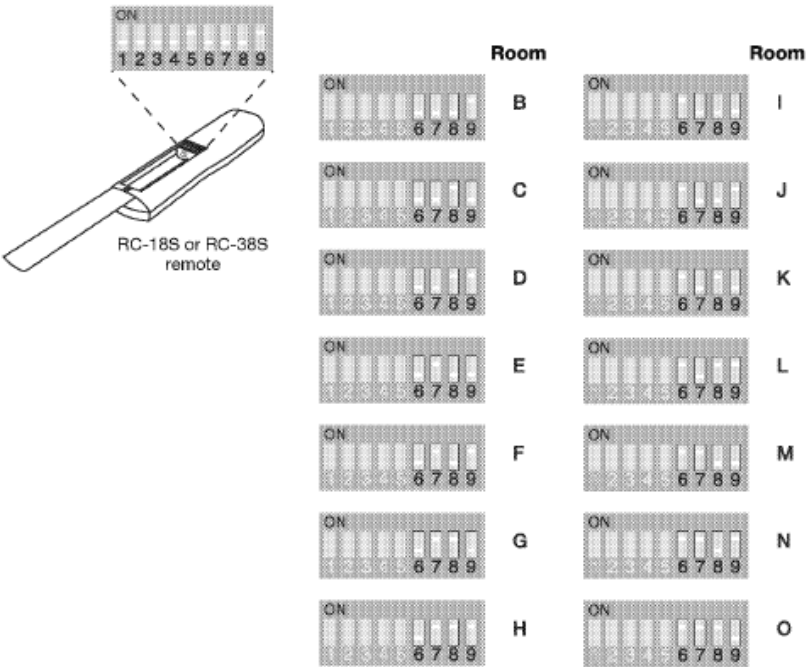
Setting up remote controls for other rooms

To set up the RC-18S or RC-38S remote:

- 1. Remove the remote control battery cover and locate the microswitches (Figure 19).
- 2. Make sure that the house code settings (switches 1, 2, 3, and 4) match the house code settings in your main room remote.
- 3. This remote is shipped from the factory set for room B. If this remote is used beyond a second room, set switches 6, 7, 8, and 9 to the same room code as set in the Lifestyle® stereo amplifier.

Note: Refer to your Lifestyle® system owner's guide for more information on operating your system in more than one room.

Figure 19
Microswitch settings for RC-18S and RC-38S remotes

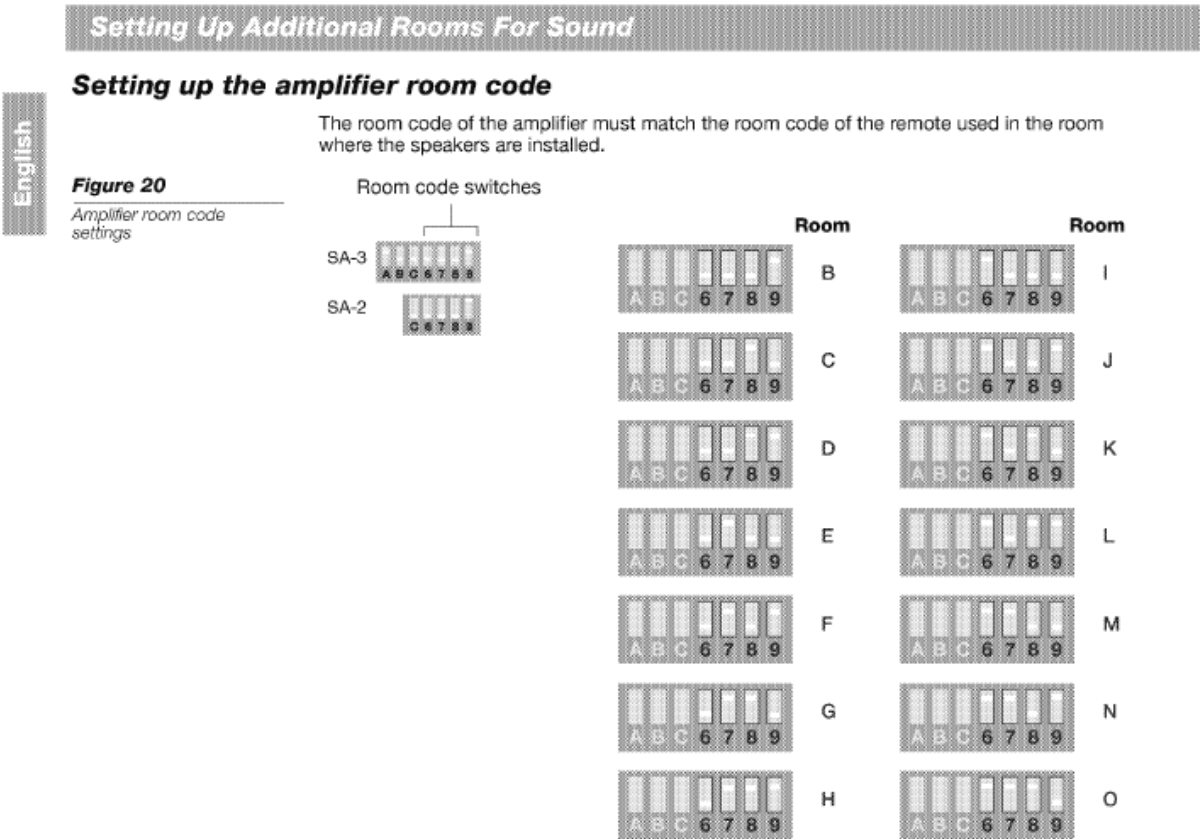


To set up the Personal® music center II:

Refer to the owner's guide included with the Personal® music center II for instructions on configuring this remote for other rooms.

English

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BOSE_SUB-0000386. See also, BOSE_SUB-0000361-448.

874. Bose Lifestyle specifically teaches a “Bose Link” that is a communication protocol

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that allows for the playing of audio in multiple rooms or multiple zones.

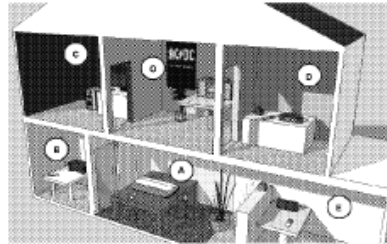


What is Bose Link?

Bose link is a communication protocol. To communicate there must be at least two participants that speak the same language. To Bose products, Bose link is that language.

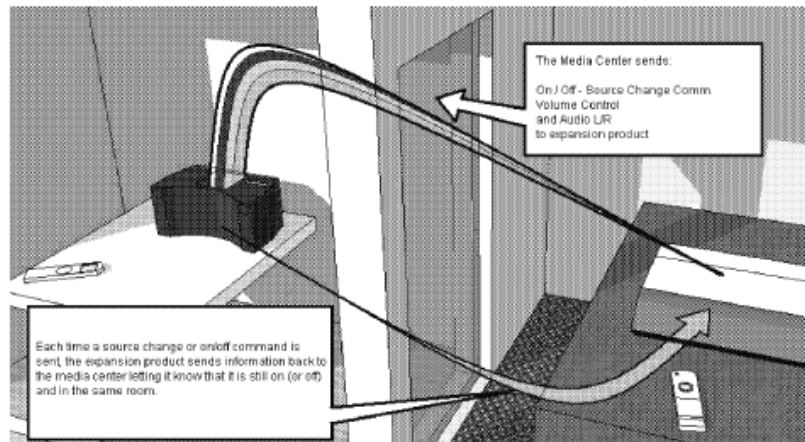
Rooms

There are 15 different rooms that can be controlled by a Bose link enabled media center. The main room – labeled room A – is reserved for the Lifestyle speaker components. The other rooms – rooms B-O – are reserved for expansion via Bose link.



For a Bose link setup to work the system must include a Bose link enabled media center (a controller), a Bose link expansion product, and an expansion remote control. Both the expansion product and the remote must be configured to operate on the same room.

A Bose link connection is essentially a conversation between the media center and the expansion device. The media center sends on/off, volume and source change commands along with audio to the expansion product. The expansion product responds by sending information back to the media center to let it know that it is still on (or off) and in the same room. This information exchange occurs each time a power or source change command is issued by the expansion remote.



When the media center receives an ON command from an expansion remote the system turns on and checks for any Bose link products that might be connected, but it will only look for Bose link products that are assigned to the same room as the remote.

Understanding Bose® link

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BOSE_SUB-0000595

BOSE_SUB-0000595.

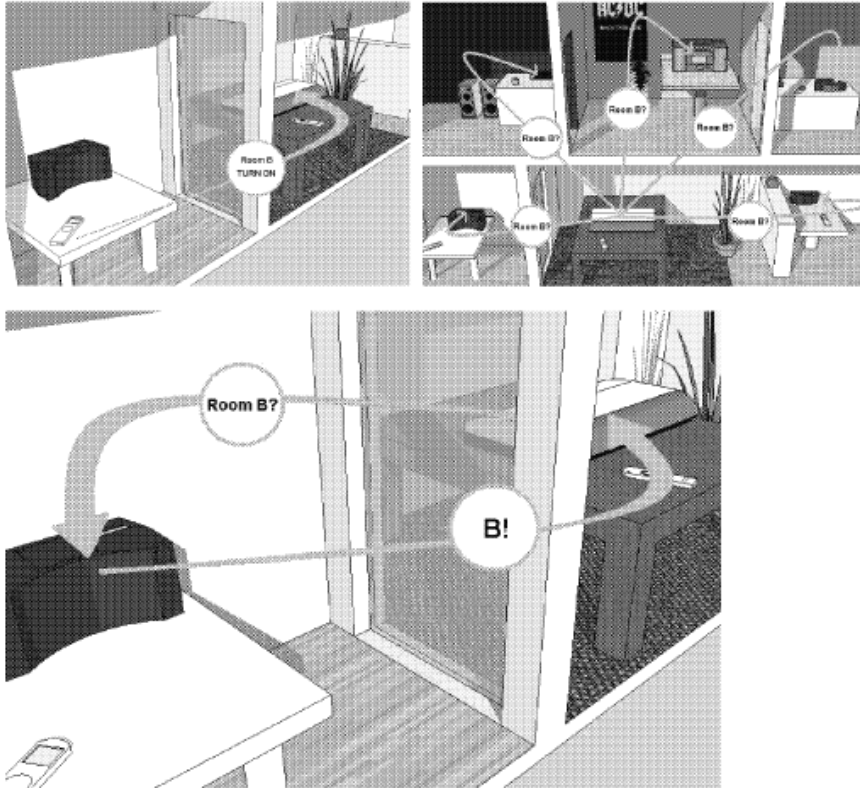
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If the media center receives a command from a remote configured for room B, for example, the media center calls out to other Bose link products which might be assigned to room B. If a connected expansion product is assigned to room B it will respond to the media center and a Bose link connection will be made. The media center will not acknowledge a response from anything not assigned to room B.



The media center will not acknowledge more than one response from the same room, either. As with any productive conversation, there can only be one person speaking at a time. If more than one product is assigned to room B the media center won't know which one to listen to. If the media center can't understand the response from the expansion products, or if there is no response at all, the media center will turn itself off and the Bose link connection will not be successful.

Understanding Bose® link

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Streams

A Bose link enabled media center is also capable of managing two separate sources at the same time. Each source can be sent to one of two different outputs - or 'streams' - within the Bose link connection. 4 of the 9 pins that make up the Bose link connection on the back of the media are responsible for delivering these streams - all of which are analog. Two pins are reserved for stream 1 audio L/R (fixed), and another two pins carry stream 2 audio L/R (fixed) - (there is another pair of pins that carry variable stream 2 audio that will be discussed later). Every Bose link expansion product has 2 inputs to accommodate each stream, and the remote control tells the device which stream to listen to. The expansion products receive fixed audio and then control volume via commands they receive from the media center carried on other pins.

Here is an example:

If an expansion remote configured for stream 1 sends an ON command to the media center, the media center will activate the pins that carry stream 1 information. The media center will also call out to any Bose link product set to the same room code as the remote. If the media center gets an answer it can understand, it will respond by telling the expansion product to turn on and listen to its stream 1 inputs. If the media center does not get a response from an expansion product set to the same room as the remote it will simply turn itself off.

The main room, or room A, can only operate on stream 1. Although any of the expansion rooms can be configured to operate on either stream 1 or stream 2, expansion rooms are generally assigned to stream 2. Since only one source can be sent to each stream at any given time, keeping Bose link expansion products on stream 2 prevents changes made in expansion rooms from affecting what is being played in the main room, and vice-versa.

Understanding Bose® link

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BOSE_SUB-0000597

BOSE_SUB-0000597.

875. I understand that Sonos does not meaningfully dispute that Bose Lifestyle discloses

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this claim limitation. Specifically, I understand that Google served an interrogatory requesting Sonos's contentions for why Claim 1 of the '885 patent is not invalid over Bose LifeStyle. I have reviewed Sonos's response ("Validity Contentions") as it relates to Bose LifeStyle and Sonos does not dispute this claim limitation. *See* Validity Contentions (Attachment A to Sonos's Supp. Rsp. To Google's First Set of Rqs) at 89.

876. I have already addressed Dr. Almeroth's constructions of "network interface" and "data network" above and incorporate that analysis into this section.

877. In paragraph 815 of his rebuttal report, Dr. Almeroth contends that I do not identify a "first zone" in my report, but Dr. Almeroth is wrong. As I discussed in my report, for example, the Bose FreeSpace Owner's Guide is an "installer interface" that allows the user to automate the system by creating scheduled events to control how selected zones and subzones are invoked at predetermined times. BOSE_SUB-0000056; BOSE_SUB-0000062 at -76, -100-103. I also discussed that Bose LifeStyle allows for multiple zones and varying operations. *See e.g.*, BOSE_SUB-00000122; 144-145; 289; 292; 384.

878. Dr. Almeroth also provides the unsupported opinion that "based on the materials I have reviewed, it is my opinion that the Bose FreeSpace product and the Bose Lifestyle 50 System are not related or compatible." This is pure conjecture, as Dr. Almeroth fails to provide any specificity as to the specific documents he reviewed or any analysis thereof. Further, as I discussed in the state of the art section, Bose Lifestyle 50 system and Bose FreeSpace are in the same field of endeavor, *infra* Section X.

879. Similarly, Dr. Almeroth contends that "I have seen no evidence that the passive speakers connected to a E4 unit include a "network interface" that enables them to send digital data packets to and receive digital data packets from another device via a data network." Again, other than his opinion, Dr. Almeroth provides no evidence that the speakers are passive, and I have

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provided evidence (e.g., BOSE_SUB-0000144) that establish that the speakers are not passive.

880. Further, Dr. Almeroth states that the SA-2 or SA-3 Amplifier products are not part of the Bose Lifestyle 50 system and thus suggests that his analysis should stop there. I addressed this above, notably, that the SA-2 and SA-3 speakers are both part of Bose's "Lifestyle" product line and thus in same field of endeavor.

881. Finally, Dr. Almeroth asserts that there is no evidence that the Bose LifeStyle utilized the "Bose link" communication protocol and that the Bose Lifestyle 50 system was not compatible with the communication protocol. I disagree. The very point of the communication protocol is to provide a "conversation" between the network interface and the speakers.

37. Limitation 1.2: "one or more processors;"

882. In my opinion, Bose LifeStyle discloses this claim limitation. For example, Bose LifeStyle utilizes Jewel Cube speakers, and the multi-room interface, with four independent audio outputs allow you to enjoy Bose sound throughout one's home.

Thank you for purchasing the Bose® Lifestyle® 50 system. Years of research lie behind this complete audio home entertainment system – the most advanced home theater system from Bose. Technological innovations that make the Lifestyle® 50 system unique include the Bose Personal™ music center, which places all system operations in the palm of your hand, and tiny Jewel Cube® speakers.

The interactive Personal music center is a clear departure from convention, communicating with the system through a two-way radio data link. The result for you is full control of this entertainment system as you move about your home.

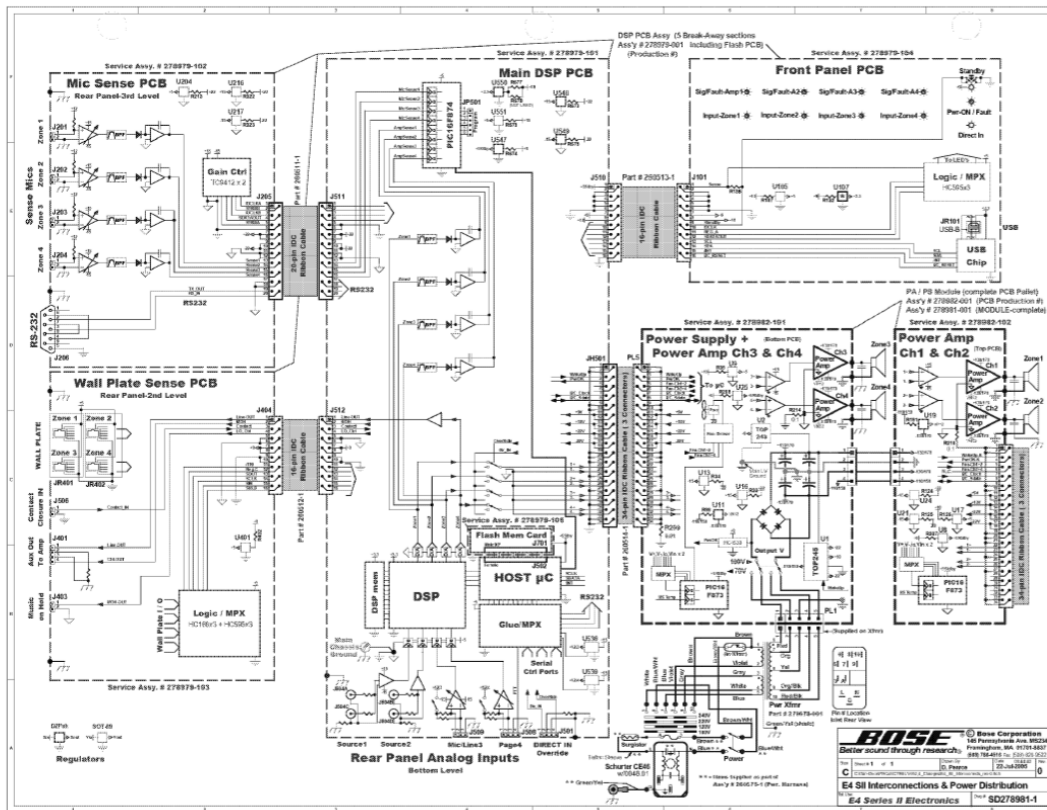
BOSE_SUB-000006.

The other elements of the Lifestyle® 50 system are designed to be hidden from view:

- The elegant Lifestyle® CD changer, designed to give you flexibility in where it is placed
- The hideaway powered Acoustimass® module that delivers the rich, full, lifelike bass
- The Bose multi-room interface, with four independent audio outputs that allow you to enjoy Bose sound throughout your home.

Id.

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BOSE_SUB-0000157

BOSE_SUB-0000157. *See also*, BOSE_SUB-0000361-448.

884. I understand that Sonos does not meaningfully dispute that Bose LifeStyle discloses this claim limitation. Specifically, I understand that Google served an interrogatory requesting Sonos's contentions for why Claim 1 of the '885 patent is not invalid over Bose Lifestyle. I have reviewed Sonos's response ("Validity Contentions") as it relates to Bose Lifestyle and Sonos does not dispute this claim limitation. *See* Validity Contentions (Attachment A to Sonos's Supp. Rsp. To Google's First Set of Rqs) at 89.

885. Dr. Almeroth repeats his criticism regarding "first zone player," which is addressed above and will not be repeated here. Beyond that, Dr. Almeroth does not credibly dispute that Bose contains one or more processors. Instead, Dr. Almeroth gives cursory treatment to the ample evidence cited within my report. Furthermore, Dr. Almeroth repeats his assertion that Bose

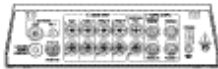
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Setting Up Your Lifestyle® Stereo Amplifier

Multi-room interface setup

English

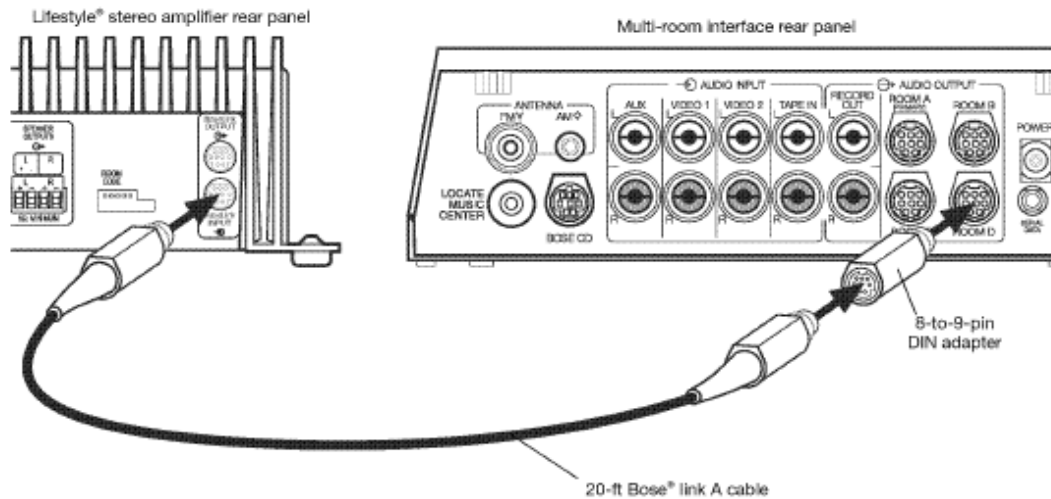
CAUTION: Before making any connections, turn the Lifestyle® system off and disconnect the music center from the AC (mains) power outlet. DO NOT plug the amplifier into an outlet until you have completed all other connections.



1. Insert the 8-to-9-pin adapter into one of the unused ROOM output connectors (B, C, or D) on the rear of the multi-room interface (Figure 10).
2. Insert one end of the Bose® link A cable into the 8-to-9-pin adapter.
3. Insert the other end of the Bose® link A cable, into the Bose® link input connector on the rear panel of the Lifestyle® stereo amplifier.

Figure 10

Lifestyle® stereo amplifier
to multi-room interface
connections



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733. Dr. Almeroth contends that “the evidence [he] have reviewed establishes that neither the Acoustimass modules of the Bose Lifestyle 50 System nor the SA-2 and SA-3 amplifiers that appear to have been compatible with the Bose Lifestyle 50 System (each of which may be referred to herein as a “Lifestyle player”) had any capability to be added to a “zone scene” comprising a “predefined grouping of zone players . . . that are to be configured for synchronous play back of media when the . . . zone scene is invoked. . . .” I disagree. First, as I previously explained, I believe that Acoustimass and the SA-2 and SA-3 amplifiers are compatible. Second, the evidence above shows that Bose has the ability to utilize the “house” button that allows operation in more than one room. The house button allows a user to control all connected rooms as one. *See e.g.*, BOSE_SUB-00000043-44. Indeed, Bose also has a “room” button that allows a user to control a single “or two or more rooms that share a source.”

734. I also disagree with Dr. Almeroth’s opinion that “based on the evidence I have reviewed, when a user set up a “shared source” of audio for multiple Lifestyle players using the Personal music center of the Bose Lifestyle 50 System, the Personal music center would transmit information to the centralized multi-room interface (not to the Lifestyle players), which would cause the multi-room interface to configure itself to distribute the same audio from the same audio source to each of the rooms so that the same audio could be played back simultaneously via the Lifestyle players. *See, e.g.* BOSE_SUB-00000001-55 at 6, 12, 17, 19, 44-45; BOSE_SUB-0000684-687 at 684-685.” Again, Dr. Almeroth purported evidence does not support his opinion, as these documents do not show that playback speakers do not also or simultaneously receive any information from the Personal music center. Indeed, the documentation refers to “radio links” that transmits data to and from the playback speakers.

Dr. Almeroth also contends that “a POSITA would not consider the multi-room interface and the Lifestyle players to be operating on a data network because the hard-wired connection there between is not a medium that interconnects devices, enabling them to send digital data packets to and receive digital data packets from each other.” I disagree. As a POSITA, it is my opinion that “data packets” can be exchanged over hard wired connections, such as ethernet

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connections, or in this case, speakers connected together. Further, the claim limitations do not require connections to be “wireless,” and Dr. Almeroth does not provide any evidence to support his assertion to the contrary.

Further, similar to the above, in paragraph 653 of my Opening report, I opined that “The Bose Link connection is essentially a conversation between the media center and the expansion device. The media center sends on/off, volume and source change commands along with audio to the zones. The zones then respond by sending information back to the media center to let it know that the zone is still active.” Dr. Almeroth, however, provides no evidentiary support for his assertion that “none of this information” is exchanged between the media center.

Dr. Almeroth also falsely contends that “to the extent that Dr. Schonfeld is asserting that the alleged ‘indication’ is sent from the Lifestyle player to the Bose link enabled media center, such a theory would fail for the additional reason that the claim requires the ‘indication’ to be received by the “first zone player.” But as evidenced above, the first zone player does receive an indication when added to the group, and a POSITA would nevertheless know that when informing a speaker that it has been added to a group, that it would have been obvious to send an indication as well.

Next, Dr. Almeroth contends that “the Bose Lifestyle 50 System evidence I have reviewed establishes that a Lifestyle player could only be a member of one group of Lifestyle players having a “shared source” of audio that was in existence at any given time, and that the only way a Lifestyle player in a first group of Lifestyle players having a “shared source” of audio could have been added to a second group of Lifestyle players having a “shared source” of audio was to destroy the first group by changing the audio source for the Lifestyle player to match the “shared source” of audio for the second group.” I disagree. To start, the Bose document that Dr. Almeroth cites says does not provide any restrictions on whether Lifestyle players could only be connect to a single source at a time. More specifically, the Bose system is meant to allow for the Lifestyle speakers to be utilized in multiple zones through a shared source via the ROOM and HOUSE buttons. Indeed,

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Connecting additional rooms

Follow the placement guidelines for the Bose® powered speakers that you plan to connect. Then review your plan for how to connect these speakers to the multi-room interface in your primary room. If you have questions or need extension cables to complete the connections, call Bose Customer Service at the numbers listed on the back inside cover of this owner's guide.

CAUTION: Make sure all components are unplugged from the power outlet before you begin hooking up additional speakers.

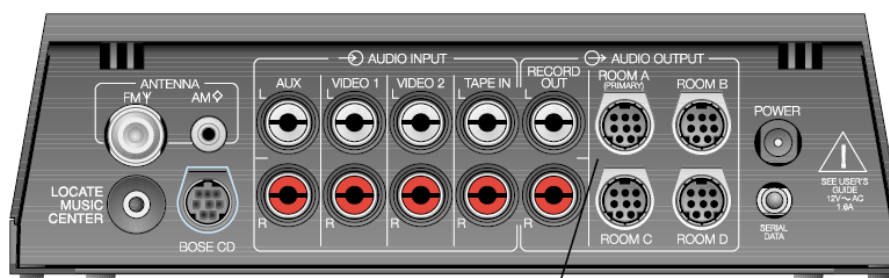
Connect the audio input cable from your additional powered speakers to the selected ROOM jack on the back of the multi-room interface.

1. Plug the small black multi-pin connector (flat side facing up) into the jack marked ROOM B, C, or D on the back of the interface.
2. Follow the instructions that came with your speakers for connecting the cable to the speakers.

Note: Be sure that each connector is inserted completely into each jack.

Figure 47

ROOM jacks on the multi-room interface



Room A, B, C, and D jacks

Id. at 40. See also, BOSE_SUB-0000361-448.

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7.0 User Interface Operation

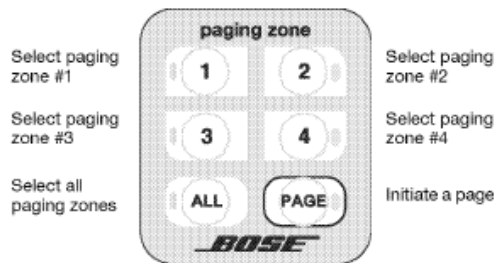
7.5 Multi-zone paging user interface operation

The Multi-zone paging user interface provides keys to select single paging zones, all paging zones and initiate a page.

Paging zones are not the same as output zones. After assigning the PAGE source to the output zones and choosing the appropriate settings in the Page Setup control pane, flashing the hardware maps the paging zone buttons accordingly.

When mapped, the paging zone **1** button will select the lowest numbered output ZONE to which the PAGE source is assigned. The paging zone **2** button will select the next lowest numbered output ZONE to which the PAGE source is assigned, and so forth.

Multi-Zone Paging User Interface



- Press **1**, **2**, **3** or **4** to select a paging zone. A green LED flashes to indicate that the zone is selected for paging. After ending a page the LED turns off.
- Press **ALL** to select all paging zones.
- Press **PAGE** to initiate a page in systems that do not use a PTT microphone.

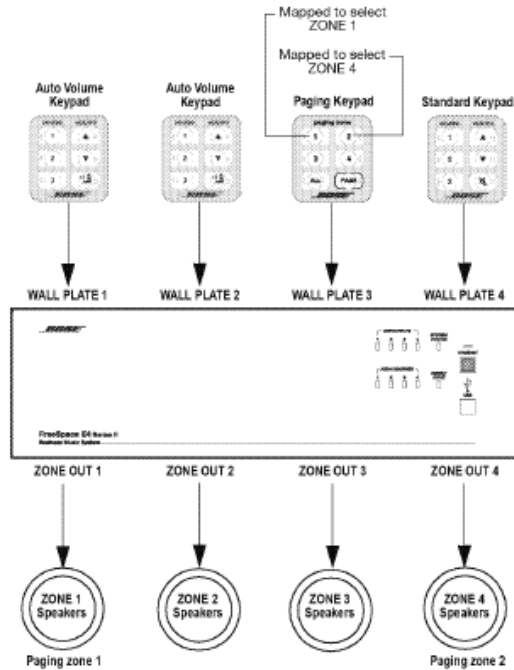
Paging User Interface Example:

- The **PAGE** source is assigned to ZONE OUT 1 and ZONE OUT 4.
- In the Page Setup control pane for ZONE 1 and ZONE 4:

Paging Type = Multi-zone

PAGE Control = Wall plate 3

- After flashing the hardware, the paging zone **1** button selects ZONE OUT 1 for paging, and the paging zone **2** button selects ZONE OUT 4 for paging.



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Setting Up Your Lifestyle® Stereo Amplifier

Multi-room interface setup

English

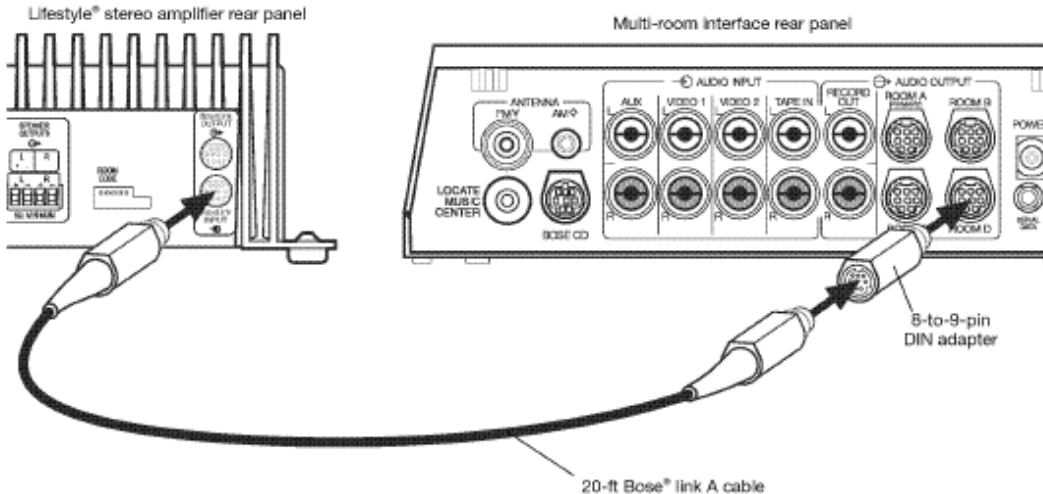
CAUTION: Before making any connections, turn the Lifestyle® system off and disconnect the music center from the AC (mains) power outlet. DO NOT plug the amplifier into an outlet until you have completed all other connections.



1. Insert the 8-to-9-pin adapter into one of the unused ROOM output connectors (B, C, or D) on the rear of the multi-room interface (Figure 10).
2. Insert one end of the Bose® link A cable into the 8-to-9-pin adapter.
3. Insert the other end of the Bose® link A cable, into the Bose® link input connector on the rear panel of the Lifestyle® stereo amplifier.

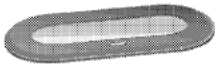
Figure 10

Lifestyle® stereo amplifier
to multi-room interface
connections



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Setting Up Your Lifestyle® Stereo Amplifier



Setting up the Personal® music center

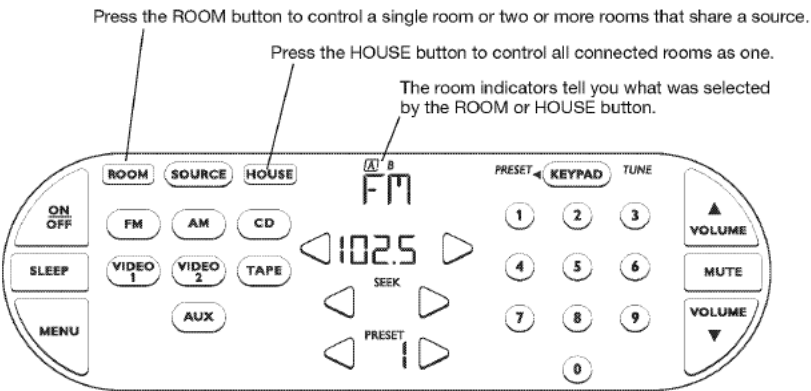
Systems that have a multi-room interface are controlled by the Personal® music center which requires no internal switch settings before it allows you to control more than one room of speakers. However, if you purchase a second Personal® music center, you must follow the procedure for setting up the Personal® music center for the first time.

Note: Refer to your Lifestyle® system owner's guide for more information on operating your system in more than one room.

Selecting other rooms with the Personal® music center

The Personal® music center allows you to control up to four sets of Bose® powered speakers placed in individual rooms. These rooms are referred to as room A, B, C, and D, with room A being the primary room (the one used for a one-room system). If two or more rooms are connected to your system, the Personal® music center displays ROOM and HOUSE buttons, and room indicators (A, B, C, and/or D). Figure 11 shows a sample display for a two-room system.

Figure 11
Sample display for a two-room system



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Setting Up Additional Rooms For Sound

English

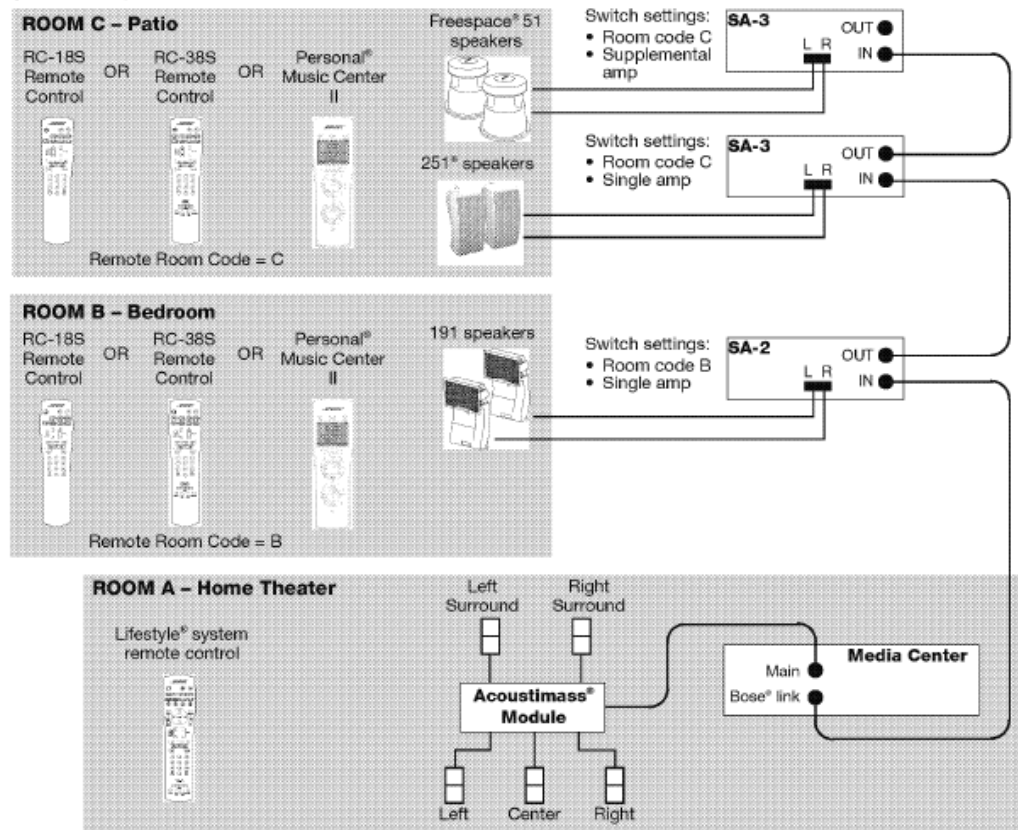
Setup guidelines for additional rooms

If you have a Lifestyle® 18 series II, 28 series II, 38 or 48 home entertainment system, you can experience stereo sound in up to 14 other rooms using Lifestyle® stereo amplifiers, compatible speaker systems and remote controls for the other rooms.

- Remote controls for other rooms must be set to the same house code as the main room remote, but each remote must be set to a different room code. See "Setting up remote controls for other rooms" on page 23.
- The Lifestyle® amplifier and its remote control must be set to the same room code. See "Setting up the amplifier room code" on page 24.
- When using more than one amplifier to power more than two speakers in a room (Figure 18, room C), all amplifiers must be set to the same room code. Also, one amplifier must be set to the single amp mode and all others must be set to the supplemental amp mode. See "Single and supplemental amplifiers" on page 25.

Figure 18

Sample installation of
Lifestyle® stereo amplifiers



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Setting Up Additional Rooms For Sound

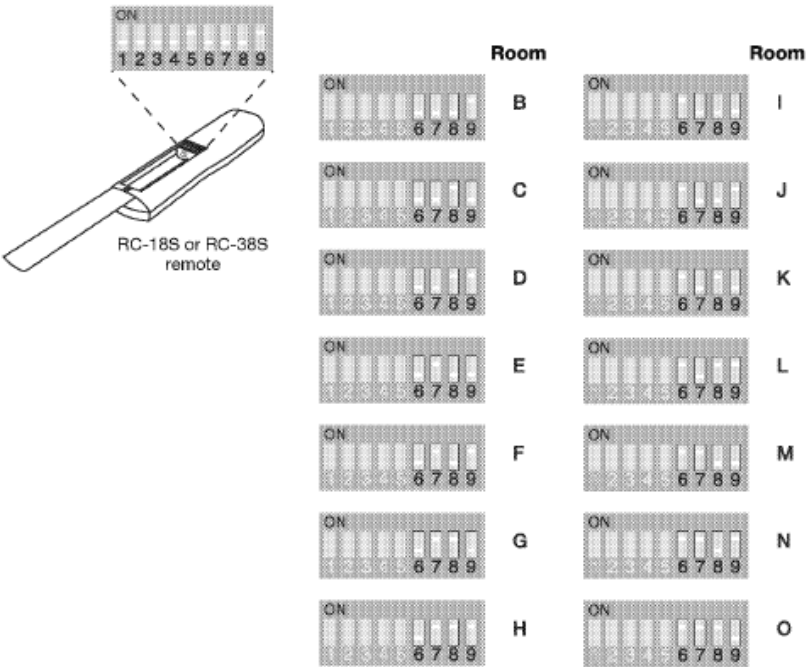
Setting up remote controls for other rooms

To set up the RC-18S or RC-38S remote:

- 1. Remove the remote control battery cover and locate the microswitches (Figure 19).
- 2. Make sure that the house code settings (switches 1, 2, 3, and 4) match the house code settings in your main room remote.
- 3. This remote is shipped from the factory set for room B. If this remote is used beyond a second room, set switches 6, 7, 8, and 9 to the same room code as set in the Lifestyle® stereo amplifier.

Note: Refer to your Lifestyle® system owner's guide for more information on operating your system in more than one room.

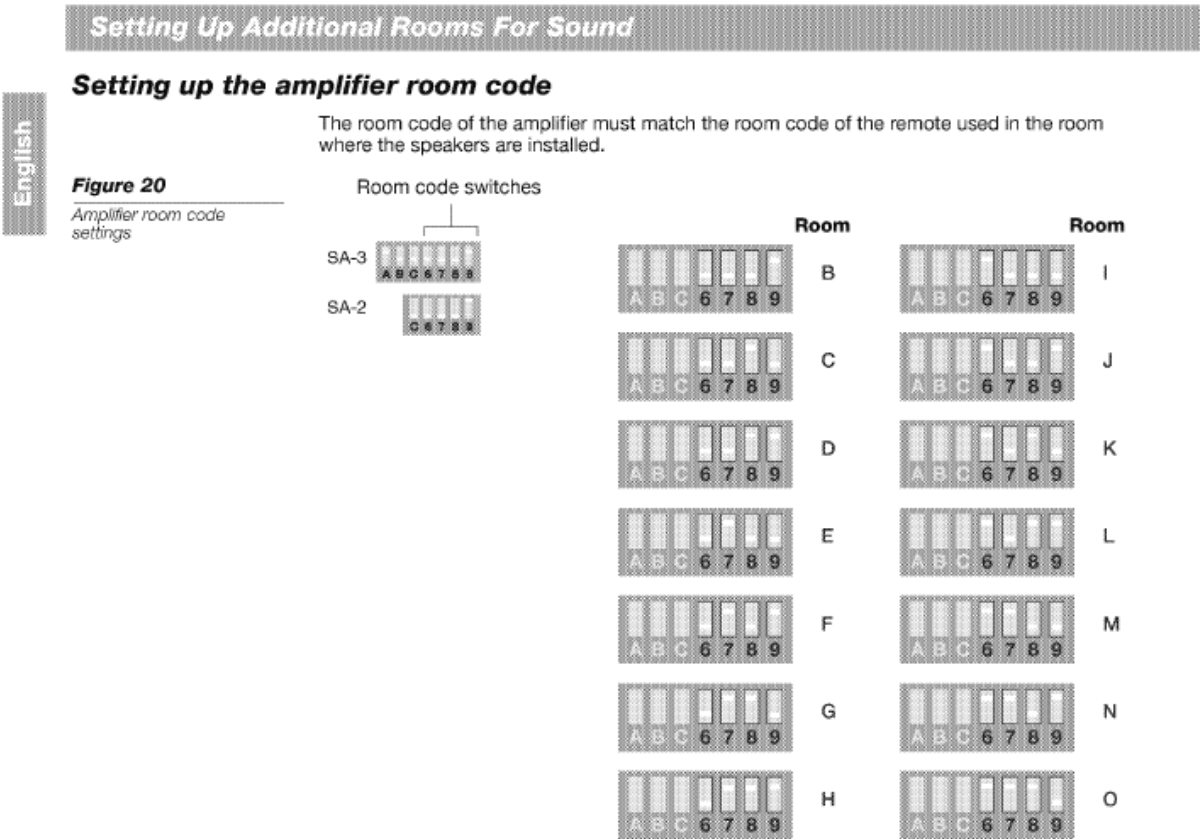
Figure 19
Microswitch settings for
RC-18S and RC-38S
remotes



To set up the Personal® music center II:
Refer to the owner's guide included with the Personal® music center II for instructions on configuring this remote for other rooms.

English

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BOSE_SUB-0000386. *See also*, BOSE_SUB-0000361-448.

904. Then, as also mentioned before, the Bose Link communication protocol allows for

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an indication that additional rooms, for example, have been added to the media center. The Bose Link connection is essentially a conversation between the media center and the expansion device. The media center sends on/off, volume and source change commands along with audio to the zones. The zones then respond by sending information back to the media center to let it know that the zone is still active. Importantly, as described below, the media center will not acknowledge commands from any zone that is not targeted or invoked (BOSE_SUB-0000596).

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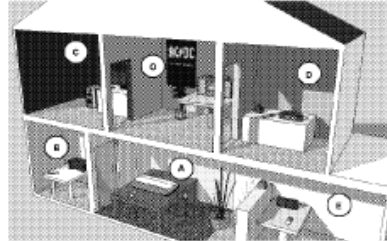
What is Bose Link?

Bose link is a communication protocol. To communicate there must be at least two participants that speak the same language. To Bose products, Bose link is that language.

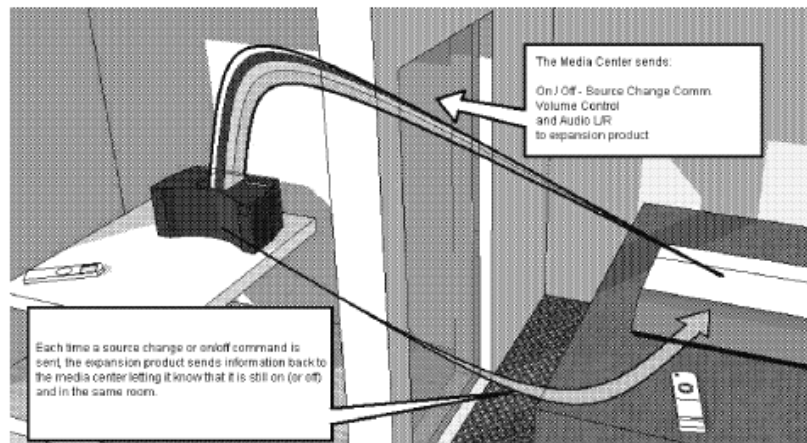
Rooms

There are 15 different rooms that can be controlled by a Bose link enabled media center. The main room – labeled room A – is reserved for the Lifestyle speaker components. The other rooms – rooms B-O – are reserved for expansion via Bose link.

For a Bose link setup to work the system must include a Bose link enabled media center (a controller), a Bose link expansion product, and an expansion remote control. Both the expansion product and the remote must be configured to operate on the same room.



A Bose link connection is essentially a conversation between the media center and the expansion device. The media center sends on/off, volume and source change commands along with audio to the expansion product. The expansion product responds by sending information back to the media center to let it know that it is still on (or off) and in the same room. This information exchange occurs each time a power or source change command is issued by the expansion remote.



When the media center receives an ON command from an expansion remote the system turns on and checks for any Bose link products that might be connected, but it will only look for Bose link products that are assigned to the same room as the remote.

Understanding Bose® link

Page 2 of 8

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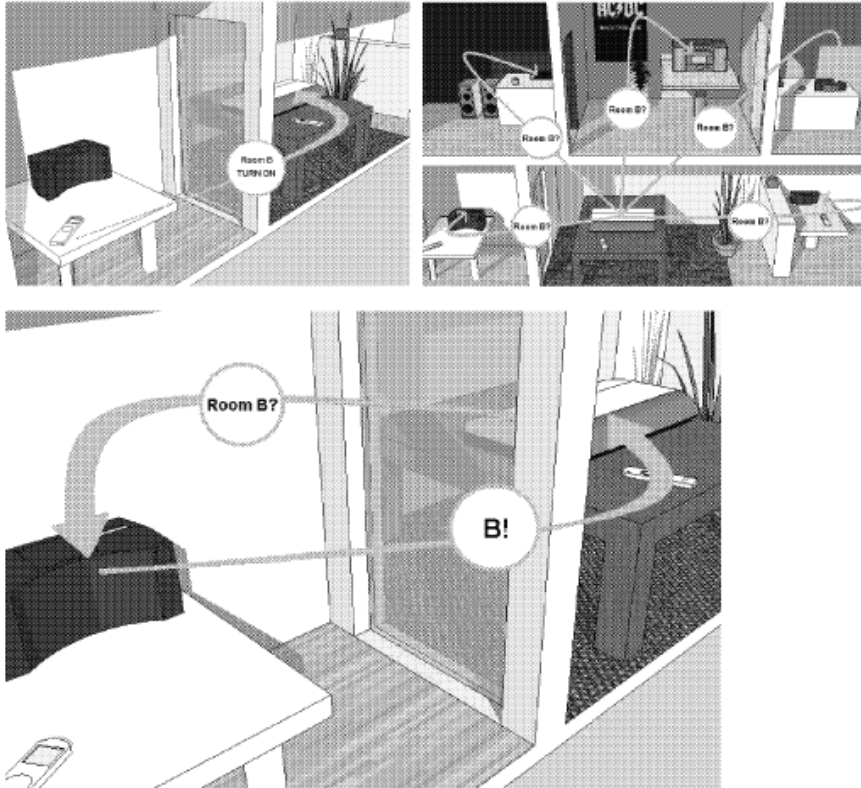
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If the media center receives a command from a remote configured for room B, for example, the media center calls out to other Bose link products which might be assigned to room B. If a connected expansion product is assigned to room B it will respond to the media center and a Bose link connection will be made. The media center will not acknowledge a response from anything not assigned to room B.



The media center will not acknowledge more than one response from the same room, either. As with any productive conversation, there can only be one person speaking at a time. If more than one product is assigned to room B the media center won't know which one to listen to. If the media center can't understand the response from the expansion products, or if there is no response at all, the media center will turn itself off and the Bose link connection will not be successful.

Understanding Bose® link

Page 3 of 8

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BOSE_SUB-0000596.

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I also incorporate by reference into this section, my rebuttals to Dr. Almeroth's opinions, as articulated above.

42. Limitation 1.7: “(ii) receiving, from the network device over the data network, a second indication that the first zone player has been added to a second zone scene comprising a second predefined grouping of zone players including at least the first zone player and a third zone player that are to be configured for synchronous playback of media when the second zone scene is invoked, wherein the second zone player is different than the third zone player;”

905. In my opinion, Bose Lifestyle discloses or renders obvious this claim limitation.

906. I incorporate by reference my discussion of Limitation 1.6 herein, which discloses receiving from a network device an indication that the zone player has been added to a zone scene comprising a predefined grouping of zone players that are to be configured for synchronous playback of media when the zone scene is invoked. Limitation 1.7 adds the limitation that the first zone player is a member of two different “zone scenes.”

907. In addition to the evidence disclosed in Limitation 1.7, the Bose Lifestyle expressly teaches managing two separate streaming sources at one time, such that room A can operate on stream 1, and room B can operate stream 2, for example.

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Streams

A Bose link enabled media center is also capable of managing two separate sources at the same time. Each source can be sent to one of two different outputs - or 'streams' - within the Bose link connection. 4 of the 9 pins that make up the Bose link connection on the back of the media are responsible for delivering these streams - all of which are analog. Two pins are reserved for stream 1 audio L/R (fixed), and another two pins carry stream 2 audio L/R (fixed) - (there is another pair of pins that carry variable stream 2 audio that will be discussed later). Every Bose link expansion product has 2 inputs to accommodate each stream, and the remote control tells the device which stream to listen to. The expansion products receive fixed audio and then control volume via commands they receive from the media center carried on other pins.

Here is an example:

If an expansion remote configured for stream 1 sends an ON command to the media center, the media center will activate the pins that carry stream 1 information. The media center will also call out to any Bose link product set to the same room code as the remote. If the media center gets an answer it can understand, it will respond by telling the expansion product to turn on and listen to its stream 1 inputs. If the media center does not get a response from an expansion product set to the same room as the remote it will simply turn itself off.

The main room, or room A, can only operate on stream 1. Although any of the expansion rooms can be configured to operate on either stream 1 or stream 2, expansion rooms are generally assigned to stream 2. Since only one source can be sent to each stream at any given time, keeping Bose link expansion products on stream 2 prevents changes made in expansion rooms from affecting what is being played in the main room, and vice-versa.

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11(6). As another possibility, the user may enable the zone player 11(1) to leave the synchrony group with zone player 11(2) and join the synchrony group with zone player 11(6). In connection with the last possibility, the zone player 11(1) can continue providing audio information from the audio information source 14(1)(1) to the zone player 11(2) for playback thereby.”); Millington at 41 (“The system is such that synchrony groups are created and destroyed dynamically, and in such a manner as to avoid requiring a dedicated device as the master device.”).

926. Millington discloses overlapping speaker groups. Millington at 17 (“As noted above, there may be multiple synchrony groups in the network audio system 10, and further that, for example, a zone player 11(n) may operate both as a master device 21 or a slave device 22(g) in one synchrony group, and as the audio information channel device 23 providing audio and playback timing information and clock timing information for another synchrony group.”); Millington at 19 (“Indeed, it will be appreciated that the zone player that is utilized as the audio information channel device for synchrony group 20(2) may also be a zone player that is utilized as the master device 21(1) or a slave device 22(1)(1),..., 22(K)(1) in the synchrony group 20(1).”).

927. I also incorporate by reference into this section, my rebuttals to Dr. Almeroth’s opinions, as articulated above.

(ii) *Limitation 1.8: “after receiving the first and second indications, continuing to operate in the standalone mode until a given one of the first and second zone scenes has been selected for invocation;”*

928. In my opinion, Bose Lifestyle discloses this claim limitation, and I incorporate my analysis from the previous claim limitations.

929. For example, Bose LifeStyle discloses adding additional zones or rooms to the media center, and then programming each room to be a certain frequency. Put another way, Bose LifeStyle allows a user to add additional speakers to zones of the Bose media center, and if any

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particular speaker is offline when the connected to the zone, it will remain offline, until invoked for use.

Setting Up Additional Rooms For Sound

Setup guidelines for additional rooms

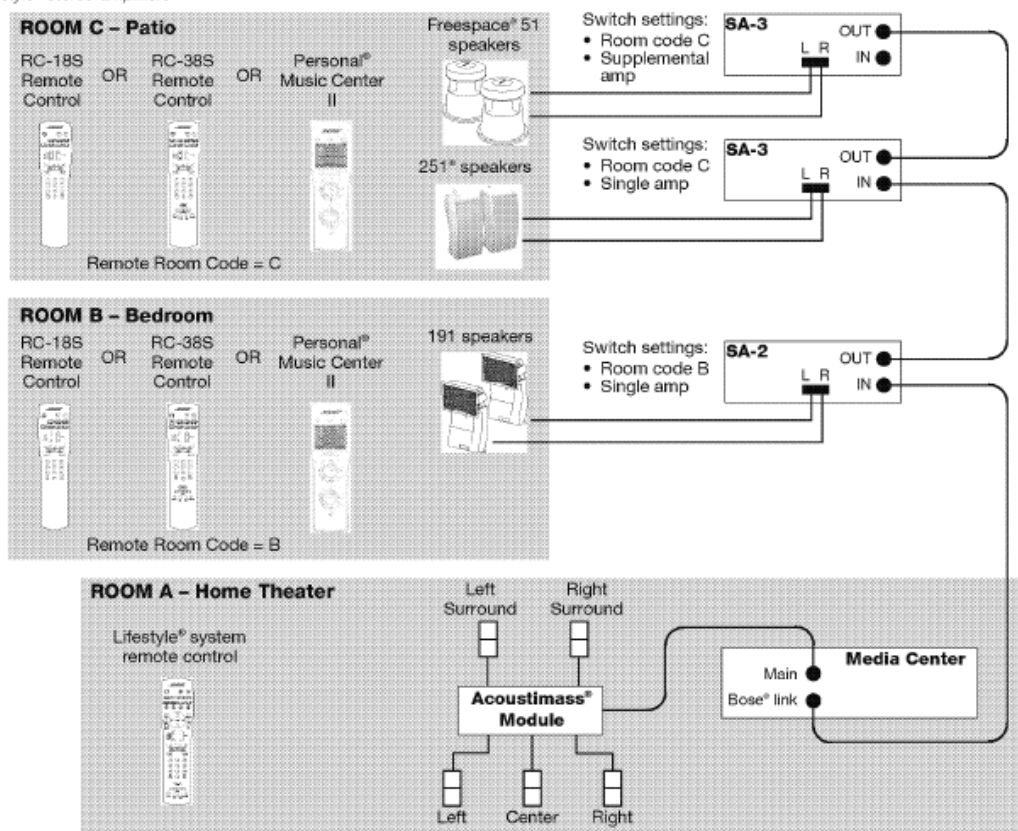
English

If you have a Lifestyle® 18 series II, 28 series II, 38 or 48 home entertainment system, you can experience stereo sound in up to 14 other rooms using Lifestyle® stereo amplifiers, compatible speaker systems and remote controls for the other rooms.

- Remote controls for other rooms must be set to the same house code as the main room remote, but each remote must be set to a different room code. See "Setting up remote controls for other rooms" on page 23.
- The Lifestyle® amplifier and its remote control must be set to the same room code. See "Setting up the amplifier room code" on page 24.
- When using more than one amplifier to power more than two speakers in a room (Figure 18, room C), all amplifiers must be set to the same room code. Also, one amplifier must be set to the single amp mode and all others must be set to the supplemental amp mode. See "Single and supplemental amplifiers" on page 25.

Figure 18

Sample installation of Lifestyle® stereo amplifiers



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Setting Up Additional Rooms For Sound

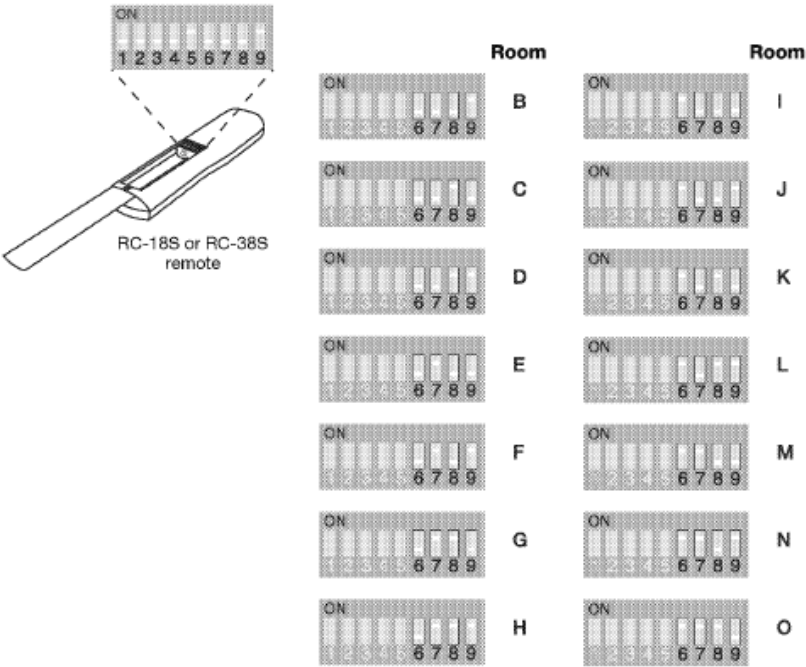
Setting up remote controls for other rooms

To set up the RC-18S or RC-38S remote:

- 1. Remove the remote control battery cover and locate the microswitches (Figure 19).
- 2. Make sure that the house code settings (switches 1, 2, 3, and 4) match the house code settings in your main room remote.
- 3. This remote is shipped from the factory set for room B. If this remote is used beyond a second room, set switches 6, 7, 8, and 9 to the same room code as set in the Lifestyle® stereo amplifier.

Note: Refer to your Lifestyle® system owner's guide for more information on operating your system in more than one room.

Figure 19
Microswitch settings for RC-18S and RC-38S remotes



To set up the Personal® music center II:
Refer to the owner's guide included with the Personal® music center II for instructions on configuring this remote for other rooms.

English

BOSE_SUB-0000385.

930. As previously mentioned, Bose LifeStyle allows a user to deliver music to

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additional zones while simultaneously playing music in the main zone. Further, Bose Lifestyle's "room selector" enables a user to target specific zones with the ability to add additional zones to the media center, which will not be brought "online" until the selected by the user.

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LIFESTYLE® SA-2 STEREO AMPLIFIER

PRODUCT POSITIONING

- Our most popular Lifestyle® system expansion stereo amplifier.
- Enjoy Bose® sound throughout your home – from one Lifestyle® system. The Lifestyle® SA-2 stereo amplifier is designed for Lifestyle® system owners who want to enjoy Bose quality music in additional rooms of their home – indoors and outdoors – with their choice of Bose speakers.

HEADLINES

Expand your Lifestyle® system to additional rooms – easily and elegantly.

Introducing the new Lifestyle® SA-2 stereo amplifier from Bose.

Bring Bose® sound to other rooms in your home – from your Lifestyle® system.

Introducing the new Lifestyle® SA-2 stereo amplifier from Bose.

Enjoy Bose® sound here...and there...from your Lifestyle® system.

Introducing the new Lifestyle® SA-2 stereo amplifier from Bose.

Movies in one room. Music in up to 14 additional rooms. All from your Lifestyle® system.

Introducing the new Lifestyle® SA-2 stereo amplifier from Bose.

KEY PRODUCT BENEFITS (IN ORDER OF IMPORTANCE)

- **High-quality sound performance:** Bose patented signal processing circuitry enables full, rich stereo sound, even at low volumes.
- **Easy hookup:** Connects to Lifestyle® systems with a single Bose® expansion cable.
- **Easy, elegant placement:** Small footprint allows amplifier to easily be hidden in a room. Mounting flanges included for mounting to wall or floor joist.
- **Versatility, enabled by Bose® link:**
 - Enables choice between two independent audio streams from the Lifestyle® system (for example, a movie in one room, music in another).
 - Includes expansion output for “daisy-chaining” multiple Lifestyle® amplifiers for up to 14 additional rooms of audio.
 - Each amplifier can be controlled independently with a Lifestyle® expansion remote control (sold separately).

KEY TECHNOLOGIES TO HIGHLIGHT (USE ICONS AS PROVIDED)

- **Bose® link:** A Bose proprietary networking technology that allows for easy, seamless expansion of your Lifestyle® system so you can enjoy different audio sources in different rooms, including outdoors. (“See Bose® link icon on “Technology Icons” page.”)
- **Bose® patented signal processing circuitry:** Automatically adjusts tonal balance at different volume levels. Thus, music sounds lifelike with full, rich lows at almost any listening level, while speech consistently sounds natural.
- **Thermal compression circuitry:** Provides automatic protection for the amplifier electronics. If the amplifier approaches an unsafe operating temperature, the volume level is automatically lowered until a safe temperature is reached. Then, the volume is automatically returned to its original level.

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LIFESTYLE® SA-2 STEREO AMPLIFIER

ADDITIONAL PRODUCT INFORMATION

DETAILED PRODUCT INFORMATION

- Room selector switches assign the amplifier to a specific room and radio frequency remote control.
- Mini-DIN expansion input and output easily connects multiple Lifestyle® amplifiers to the Lifestyle® media center in a daisy chain, whenever two or more pairs of speakers are desired in a specific location (for example, outdoors or in a large hall).
- Wired Volume Control (VCA) input provides connection for an on-wall volume control (can be used with or in place of a Lifestyle® radio frequency remote control).
- Finned cast aluminum housing dissipates heat efficiently for lower operating temperatures, even at full output.
- Integrated mounting flanges allow for permanent mounting to walls or floor joists, if desired.
- Bose® expansion cable allows for a single connection of the amplifier to the Lifestyle® media center or multi-room interface.
- Dimensions: 4 1/2" H x 14 1/4" W x 5 1/2" D (9 x 36 x 13.8 cm).
- Weight in carton: 7.6 lbs. (3.45 kg).
- Power rating: Two-channel stereo operation, 40 watts (minimum) per channel.
- Speaker impedance: Compatible with speakers rated 6 ohms or higher.
- Color: Black.
- Limited one-year transferable warranty remains with the system even if ownership passes to another person.

OPTIONAL ACCESSORIES

- Lifestyle® radio frequency expansion remote controls (RC-185 for Lifestyle® 18 and 28 Series II systems, RC-38S and Personal® Music Center II for Lifestyle® 38 and 48 systems).

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931. That is, Bose Lifestyle allows additional zones to listen to what is being played in

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the main room, or alternatively, something different. Alternatively, Bose LifeStyle allows the user the ability to add additional zones to the media center while audio is played in different zones. The newly added zones will remain offline until targeted or prompted by the user.

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LIFESTYLE® SA-2 STEREO AMPLIFIER

SUGGESTED ADVERTISING SAMPLES

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Attention Lifestyle® system owners: Did you know your Lifestyle® system can deliver music to other areas in your home – even while it's busy playing a DVD movie in the main room? Bose® link expansion capability makes it possible. And the Lifestyle® SA-2 stereo amplifier makes it easy. One simple connection of the SA-2 amplifier to the Bose® link output of your Lifestyle® system media center brings fresh musical possibilities to another room, including outdoors. Just add your choice of Bose stereo speakers. (Note: Lifestyle® SA-3 amplifier recommended for more powerful Bose speakers.) You can listen to what's playing in the main room...a CD, for example, or something different – perhaps your favorite FM station. Both at the same time, from one Lifestyle® system. So, the kids and their friends can keep on watching their movie while you enjoy some quality time – and quality Bose sound – out on the patio. And you can control your music from wherever you are with the dedicated radio frequency remote control. Bose patented signal processing circuitry automatically adjusts tonal balance for practically any volume level. The SA-2 amplifier is small enough to be easily hidden on the floor or on a shelf. You can even mount it to a wall or a floor joist. Get more out of your Lifestyle® system through Bose® link...and the SA-2 Lifestyle® stereo amplifier.

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Bose® Lifestyle® SA-2 Stereo Amplifier

The most popular stereo amplifier from Bose works with your Lifestyle® system – and Bose® link – to bring music to a second room of your home, even outdoors. Simply connect the amplifier to the Bose® link output of your Lifestyle® media center with the included Bose® link cable, then connect your choice of Bose speakers to the amplifier. With the optional Lifestyle® expansion remote control you can choose the same musical program playing in the main room (a CD, for example) or something different (FM stereo). Compatible with Bose speakers rated 6 ohms or higher. Two-channel stereo operation, 40 watts (minimum) per channel. Size: 3½"H x 14½"W x 5½"D. Color: Black.

SIMPLIFIED BULLETED FORMAT

Our most popular Lifestyle® system expansion stereo amplifier.

- Works with your Lifestyle® system and Bose® link to bring high-quality sound to other rooms in your home.
- Full, rich stereo sound, even at low volumes, from Bose® patented signal processing circuitry.
- Enables on-location choice between two independent audio streams from a Bose® link-enabled Lifestyle® system, with a Lifestyle® expansion remote control.
- Easy to hook up, easy to conceal.
- Room selector switches can assign multiple SA-2 amplifiers to specific rooms and specific Lifestyle® radio frequency remote controls.

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932. Indeed, as shown below, Bose LifeStyle allows for a user to control a single room

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or two or more rooms that share a source (Room button), or to control all connected rooms as one (House button). Based on the room indicators, a boxed letter indicates the presently -selected room or rooms, and only these rooms will be affected by any sources changes. In my opinion, the implication is that when additional zones are added to the Bose LifeStyle media center, those additional zones will remain offline, until prompted by the user. At that time, as further described below, the Bose Link communication protocol is used to communicate with the newly added zone to bring it “online.”

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956. Further, Bose Link is used as protocol to communicate between and amongst the various zones in order to invoke, for example, the play command that simultaneously plays audio in multiple zones. More specifically, Bose Link in conjunction with the media center operates over a network and allows for a user's pre-defined zones to also play different audio in simultaneously.



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What is Bose Link?

Bose link is a communication protocol. To communicate there must be at least two participants that speak the same language. To Bose products, Bose link is that language.

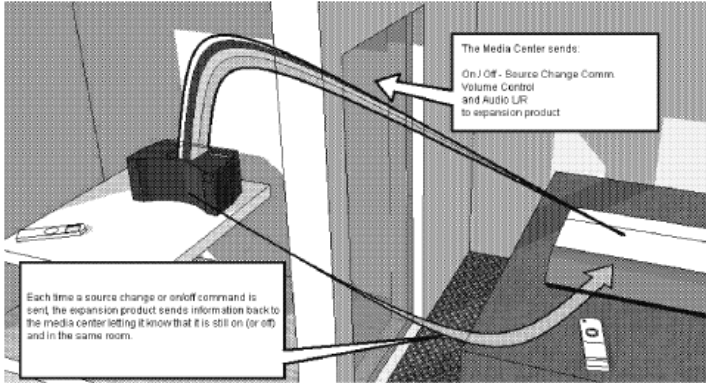
Rooms

There are 15 different rooms that can be controlled by a Bose link enabled media center. The main room – labeled room A – is reserved for the Lifestyle speaker components. The other rooms – rooms B-O – are reserved for expansion via Bose link.



For a Bose link setup to work the system must include a Bose link enabled media center (a controller), a Bose link expansion product, and an expansion remote control. Both the expansion product and the remote must be configured to operate on the same room.

A Bose link connection is essentially a conversation between the media center and the expansion device. The media center sends on/off, volume and source change commands along with audio to the expansion product. The expansion product responds by sending information back to the media center to let it know that it is still on (or off) and in the same room. This information exchange occurs each time a power or source change command is issued by the expansion remote.



When the media center receives an ON command from an expansion remote the system turns on and checks for any Bose link products that might be connected, but it will only look for Bose link products that are assigned to the same room as the remote.

Understanding Bose® link

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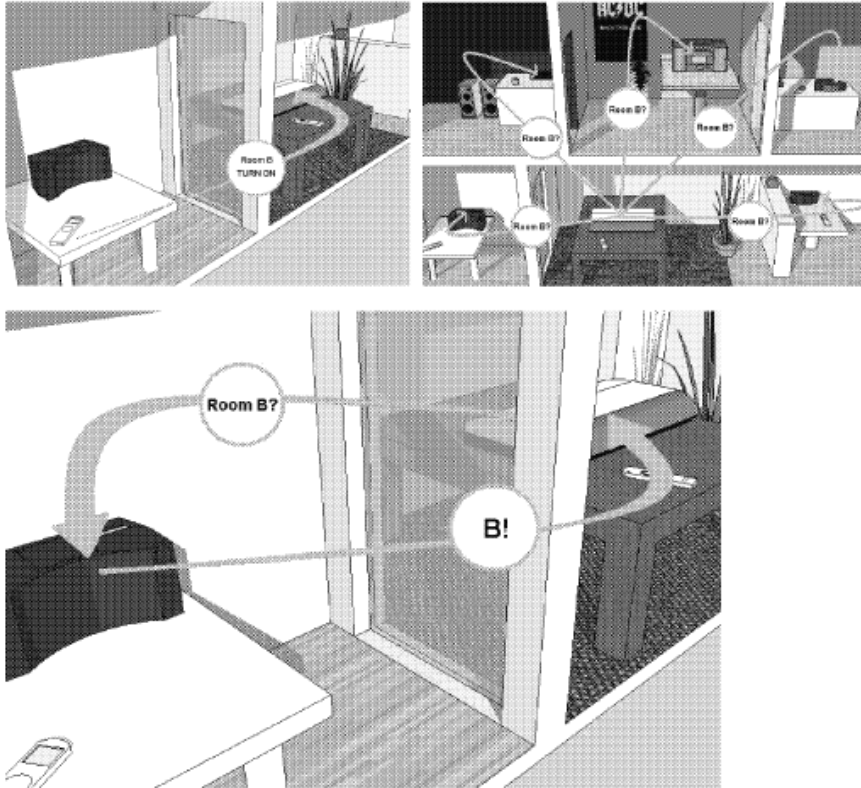
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If the media center receives a command from a remote configured for room B, for example, the media center calls out to other Bose link products which might be assigned to room B. If a connected expansion product is assigned to room B it will respond to the media center and a Bose link connection will be made. The media center will not acknowledge a response from anything not assigned to room B.



The media center will not acknowledge more than one response from the same room, either. As with any productive conversation, there can only be one person speaking at a time. If more than one product is assigned to room B the media center won't know which one to listen to. If the media center can't understand the response from the expansion products, or if there is no response at all, the media center will turn itself off and the Bose link connection will not be successful.

Understanding Bose® link

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Streams

A Bose link enabled media center is also capable of managing two separate sources at the same time. Each source can be sent to one of two different outputs - or 'streams' - within the Bose link connection. 4 of the 9 pins that make up the Bose link connection on the back of the media are responsible for delivering these streams - all of which are analog. Two pins are reserved for stream 1 audio L/R (fixed), and another two pins carry stream 2 audio L/R (fixed) - (there is another pair of pins that carry variable stream 2 audio that will be discussed later). Every Bose link expansion product has 2 inputs to accommodate each stream, and the remote control tells the device which stream to listen to. The expansion products receive fixed audio and then control volume via commands they receive from the media center carried on other pins.

Here is an example:

If an expansion remote configured for stream 1 sends an ON command to the media center, the media center will activate the pins that carry stream 1 information. The media center will also call out to any Bose link product set to the same room code as the remote. If the media center gets an answer it can understand, it will respond by telling the expansion product to turn on and listen to its stream 1 inputs. If the media center does not get a response from an expansion product set to the same room as the remote it will simply turn itself off.

The main room, or room A, can only operate on stream 1. Although any of the expansion rooms can be configured to operate on either stream 1 or stream 2, expansion rooms are generally assigned to stream 2. Since only one source can be sent to each stream at any given time, keeping Bose link expansion products on stream 2 prevents changes made in expansion rooms from affecting what is being played in the main room, and vice-versa.

Understanding Bose® link

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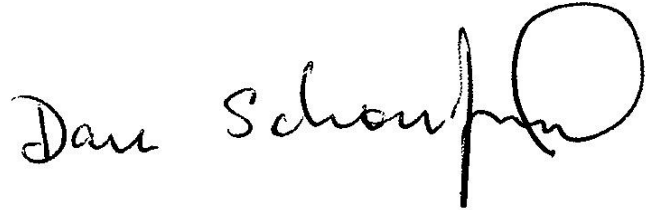
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957.

I also incorporate by reference into this section, my rebuttals to Dr.

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I, Dan Schonfeld, declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

A handwritten signature in black ink that reads "Dan Schonfeld". The signature is written in a cursive style, with the first name "Dan" and last name "Schonfeld" clearly legible. The signature ends with a large, circular flourish.

DATED: November 30, 2022

Dan Schonfeld, Ph.D